Wednesday, November 5, 2014
POSTER SESSION
5:30 p.m. / Building 34 Gallery I

CONTRIBUTED POSTERS ON EXITING AND UPCOMING MISSIONS

(MESSENGER, OSIRIS-Rex, Rosetta, Hayabusa 2, Mangalyaan/Indian Mars Orbiter mission, JUICE, Europa Clipper, ExoMars, MAVEN, LADEE, ...)

Schmidt W. Laitinen T. Järvinen R. Polkko J. Harri A.-M.
Low Power Solutions for Rosetta Instruments: Finnish Contributions to an Exciting Project **[#1037]**
The Finnish Meteorological Institute (FMI) provided hardware or software for five different instruments and for one system device onboard Rosetta satellite and for an instrument and a system device onboard the Philae lander.

Mottola S. Michaelis H. Bresch W. Jaumann R. Arnold G. et al.
ROLIS, A Close-up Look at the Surface of 67P. **[#1058]**
ROLIS is the descent/close-up imager onboard Philae, the Rosetta lander. The experiment objectives and the instrument capabilities are described.

Caplinger M. A. Ravine M. A. Hansen C. J.
Junocam: the challenges of adding an imaging system to the Juno Mission **[#1073]**
Junocam was added to the Juno Mission during Phase A. To limit cost, a camera design from MSL was adapted to the Juno requirements. There were numerous challenges in doing so, all of which were successfully surmounted.

Fletcher Z. J. McMichael R. Cheng A. F. Hibbitts C. A.
BOPPS Infrared Camera. **[#1123]**
The abstract describes a balloon-borne planetary imager which will fly one month before the workshop to observe the comet Siding Spring along with the Mars spacecraft MRO and MAVEN and the Curiosity rover.

INSTRUMENTATION FOR IN-SITU ANALYSIS MISSIONS

(Venus in-situ Explorer, Titan Lake Lander, ...)

Palomba E. Longobardo A. Dirri F. Zampetti E. Biondi D. et al.
VISTA: A Micro-Ther,mogravimeter to Measure Water and Organics Content in Planetary Environment **[#1052]**
The presentation focuses on the VISTA instrument (developed by a consortium of Italian institues), its large field of planetary applications, its technical characteristics and the functional and performance tests performed.

Li X. Getty S. A. Grubisic A. Brinckerhoff W. B. Cornish T. et al.
New Developments in Reversible-Polarity Laser Time-of-Flight Mass Spectrometry for Future In Situ Planetary Missions **[#1067]**
A reversible polarity laser desorption/ionization time-of-flight mass spectrometer incorporating curved field reflectron, and pulsed pin ion gate has been developed.Data from this analyzer is shown to have advanced analytical capabilities.

Trainer M. G. Mahaffy P. R. Brinckerhoff W. B. Johnson N. M. Glaze L. S.
Investigating the Origin and Evolution of Venus with In Situ Mass Spectrometry **[#1083]**
Measurement of noble gas abundances on Venus remain a high priority for planetary science. This can be accomplished as part of an atmospheric investigation using flight-proven technology and demonstrated enrichment techniques.

Yingst R. A. Ravine M. A. Bartley J. K. Cohen B. A. Edgett K. S. et al.
Hawkeye: Deciphering Lithologic Clues Remotely and Rapidly from Stationary and Mobile Platforms. **[#1094]**
Hawkeye, a mast-mounted, 2-megapixel RGB color camera with a focusable macro lens, is a simple, heritage-rich investigation that provides hand lens scale lithology from actionable distances, maximizing the efficiency of landed or roving vehicles.

Szopa C. Buch A. Coll P. Cabane M. Coscia D. et al.
Gas chromatography to characterize the molecular composition of extraterrestrial environments **[#1110]**
We present results obtained these two last decades with GCMS instrumentation, using compact GC systems. Are also presented recent developments on miniaturized GC components to be used in the future in science payloads with limited ressources.

Uckert K. Chanover N. J. Getty S. Grubisic A. Li X. et al.
Using IR Spectroscopy To Optimize Organic Detection With A Two-Step Laser Desorption/Ionization Time-of-Flight Mass Spectrometer **[#1113]**
We explore the dependence of the IR desorption laser wavelength of a two step laser desorption/ionization time-of-flight mass spectrometer on the strength of IR absorption features of organically doped sulfates to optimize the detection of organic species.

Chanover N. J. Uckert K. Voelz D. G. Boston P. J.
The Development and Field Testing of the Portable Acousto-optic Tunable Filter Spectrometer for Astrobiology **[#1139]**
We present the first field observations of cave environments using a portable reflectance spectrometer sensitive between 1.6-3.6 ?m. We will present a suite of PASA spectra in order to demonstrate its efficacy as a tool for biomarker detection.

Sultana M. Adkins-Reick R. Stern J. C.
Graphene Chemical Sensor Array for in situ Chemical Analysis **[#1156]**
We are developing highly sensitive, selective and low resource graphene chemical sensor arrays for in situ detection of trace gases and volatile organics. The versatile nature makes these sensors suitable for both orbiters and landed missions.

POSTER SESSION
5:30 p.m. / Building 34 Gallery II

INSTRUMENTATION FOR NEXT GENERATION ORBITERS
(Io, Mars 2020, TGO/ExoMars, ESA/JUICE, Europa Clipper mission, Enceladus, Trojan Tour and Rendezvous, ...)

Schmitz N. Palumbo P. Jaumann R. Della Corte V. Zusi M. et al.
JANUS on JUICE: A Camera to Investigate Ganymede, Europa, Callisto and the Jovian System. **[#1054]**
ESA's JUICE mission will carry the camera system JANUS, an optical camera to study global, regional and local morphology and processes on the Jovian moons, and to perform mapping of the Moon's surfaces and the clouds on Jupiter.

Cadu A. Devoto P. Louarn P. Sauvaud J. A.
Grazing Incidence Time-of-Flight Mass Spectrometer: Prototype Results and Possible Improvements **[#1064]**
We designed a complete time-of-flight mass spectrometer prototype for space plasma instrumentation, using grazing incidence MCP to replace usual carbon foil for electron emission. We present the first results and possibilities of improvements.

Westlake J. H. Kasper J. C. Rymer A. M. Case A. W. Stevens M. L. et al.
The Influence of Magnetospheric Plasma on Magnetic Sounding of Europa's Interior Oceans: Plasma Instrumentation for the Europa Clipper Mission. **[#1081]**
We present instrumentation designed for operation on the Europa Clipper spacecraft, consisting of Faraday cup sensors, that can pro-vide the high quality plasma measurements that are crucial to the success of a Europa magnetic sounding experiment.

Brown A. -D. Aslam S. Barrentine E. M. Mikula V. Schmidt A. et al.
Micromachined Thermopile Arrays with Novel Thermoelectric Materials **[#1091]**
We have fabricated and characterized novel thermopile detectors, which use micromachined 2 micron-thick Si legs to thermally isolate the hot and cold thermocouple regions.

Hibbitts C. A. Boldt J. D. Liang S. X. Edens W. K. Kelly M. A. et al.
Uncooled Thermal Infrared Camera Development at JHU-APL **[#1107]**
We will present our development effort for a ~ megapixel uncooled TIR camera and some results from an aircraft test flight.

Parsons A. M. Boynton W. V. Evans L. G. Hamara D. Harshman K. et al.
Orbital High Purity Germanium (HPGe) Composition Measurements of Carbonaceous Asteroids **[#1111]**
HPGe gamma ray spectrometers have very successfully mapped the subsurface bulk elemental compositions of Mars and Mercury. This powerful technique can also be applied to determine the subsurface bulk elemental compositions of carbonaceous asteroids.

Bloser P. F. Schwadron N. Bancroft C. Legere J. Ryan J. et al.
Dose Spectra from Energetic Particles and Neutrons (DoSEN) **[#1115]**
DoSEN combines two advanced complementary radiation detection concepts with fundamental advantages over traditional dosimetry. DoSEN measures energy and charge distribution of energetic particles in a way not possible with current dosimeters.

MacDonald E. A. Funsten H. O. Larsen B. A. Reeves G. D. Skoug R. M. et al.
A High TRL Low Resource "2 in 1" Concept for Magnetospheric Plasma Mass Spectrometry for High Radiation Planetary Environments **[#1128]**
A High TRL Low Resource "2 in 1" Concept for Magnetospheric Plasma Mass Spectrometry for High Radiation Planetary Environments, based on the HOPE instrument flown on the Van Allen Probes.

Glenn J.
High-J CO as a Probe of Warm Molecular Gas in Galaxies: Herschel Evidence for Feedback and the Need for Future Far-Infrared Spectroscopy **[#1002]**
High-J CO observations of LIRGs revealed a warm component of molecular gas that carries ~90% of the CO luminosity. High resolution FIR observations will be required to characterize ISM feedback and understand consequences for galaxy evolution.

MacEwen H. A.
In-space Infrastructures: Synergisms Among Disciplines in Astrophysics **[#1004]**
Addresses in-space infrastructures to assist in the assembly and servicing of large space telescopes in general, and is intended to enhance interactions among the FAR-IR community, and the space community at large (e.g., human exploration).

Sorensen P. H. Davis B. J. Kline-Schoder R. J. Morrison R. L.
An Ultra-Compact, High-Accuracy Star Tracker **[#1013]**
Creare's Ultra Compact Star Tracker is estimated to have mass less than 650 g, volume less than 400 cm3, and consume less than 0.5 W of power, while providing estimated attitude accuracy of 1 arc second in pitch and yaw and 10 arc seconds in roll.

TECHNOLOGY FOR IN-SITU ANALYSIS AND SAMPLE RETURN

(Lunar, Mars, Comet surface (i.e. ROsetta), NEOs (i.e. OSIRIS-Rex), …)

John K. K. Abell P. A. Graham L. D.
Surface Investigations of Asteroids: Science Justification and the Need for Instrument Development **[#1118]**
There is very limited knowledge about the surface of asteroids. There is a lack of scientific data on the properties of regolith and a lack of instrumentation to characterize the surface. Surface interaction is key in order to obtain ground truth.

Clark P. E. Farrand W. Scheld D. Martin J. Dreyer C.
MIA: Miniature In-Situ Analyzer for Mars, the Moon or Asteroids **[#1026]**
We are developing MIA, a next-generation in-situ geochemical, mineralogical, and petrological analysis tool requiring no sample preparation, combining XRF and XRD instruments with a compact X-ray source, and dual CCD detectors.

Segal N. R. E. Osinski G. R. Dietrich P. Tornabene L. L. Coulter A. B. et al.
Demonstrating TEMMI: A Three-Dimensional Exploration Multispectral Microscopic Imager on Geologic Materials. **[#1095]**
Demonstration of the capabilities of the Three-Dimensional Exploration Multispectral Microscopic Imager (TEMMI)on geologically relevant materials. TEMMI has three different operating modes: 2D colour, 3D and Ultraviolet (UV), including multispectral.

Lim L. F. Getty S. A. Kotecki C. A. Southard A. E. Gaskin J.
A Miniature Electron Probe for In Situ Elemental Microanalysis **[#1106]**
The Mini-EPMA is an adaptation of the standard laboratory technique of electron probe microanalysis (EPMA) to a flight instrument suitable for a lander or rover mission.

Wei J. Wang A. Goetz W. Cornor K.
Quantification of Fluorescence Emission from Extraterrestrial Materials **[#1112]**
Quantification of fluorescence emissions from Martian meteorites, carbonaceous condrites and terrestrial samples were obtained from a fluorescence microscope.

Wei J. Wang A. Lu Y. Connor K. Bradley A.
Detection Limits of Biomarkers by Micro-Beam 532 nm Laser Raman Spectrometry (LRS) **[#1117]**
We present detection limits of biosmarkers by micro-beam 532 nm laser Raman spectrometry.

Beaty D. W. Liu Y.
Planning for the Earth-Based Instruments and Associated Sample Preparation Procedures Needed to Achieve the Scientific Objectives of MSR. **[#1122]**
Now that NASA has selected the instruments for the M-2020 sample-collecting rover, the attention of the instrument-planning/building community needs to shift in part to the instruments needed to evaluate the samples if they are returned to Earth.

POSTER SESSION
5:30 p.m. / Building 34 Gallery III

INSTRUMENTS ON FUTURE MARS LANDERS
(ExoMars, Mars 2020 & beyond, …)

Polkko J. Kahanpää H. Harri A-M. Genzer M. Nikkanen T. et al.
Atmospheric Pressure & Humidity Instrument Technologies for Planetary Landers **[#1035]**
Finnish Meteorological Institute has provided meteorological pressure & humidity instruments for several planetary landing missions. Flown instruments on successful missions are presented as well as those under development for coming Mars missions.

Southard A. E. Adachi T. Brown G. Gonnsen Z. Johnson C. et al.
High speed and accurate pressure measurement with a mems pressure gauge from 100 to 0.1 mtorr in support of MOMA-MS **[#1059]**
We demonstrate an approach to improve response time of a transistor can sized, 300-600 microWatt pirani pressure gauge and demonstrate its readiness for use in the MOMA ion trap mass spectrometer.

Blake D. F. Sarrazin P. Bristow T.
Mapping alpha-particle X-ray Fluorescence Spectrometer (Map-X) **[#1080]**
Map-X is an arm-based imaging XRF spectrometer. It utilizes a radioisotope fluorescent source, an X-ray μ-pore Optic (MPO) and an X-ray sensitive CCD to record postage stamp - sized element maps and XRF spectra of ground-selected ROI.

Fries M. Bhartia R. Beegle L. Burton A. Ross A. et al.
The Calibration Target for the Mars 2020 SHERLOC Instrument: Multiple Science Roles for Future Manned and Unmanned Mars Exploration **[#1093]**
The SHERLOC instrument is a deep-UV Raman/fluorescence instrument selected for the Mars 2020 rover instrument suite. SHERLOC's calibration target includes space suit materials and meteorite samples to serve multiple SMD and HEOMD science roles.

Brinckerhoff W. Danell R. van Amerom F. Pinnick V. Li X. et al.
Development of a Linear Ion Trap Mass Spectrometer (LITMS) Investigation for Future Planetary Surface Missions **[#1109]**
We present an overview of the LITMS investigation under development with support of the Maturation of Instruments for Solar System Exploration (MatISSE) program.

Pinnick V. T. Buch A. Grand N. Humeau O. van Amerom F. H. W. et al.
Mars Organic Molecule Analyzer: Performance of the Gas Chromatography-Mass Spectrometry Mode of Operation. **[#1119]**
The Mars Organic Molecule Analyzer, a key analytical tool aboard the 2018 ExoMars Rover, is a combined pyrolysis gas chromatography and laser desorption mass spectrometer. This report focuses on the current performance of the GC-MS interface.

Grubisic A. van Amerom F. H. W. Danell R. M. Pinnick V. T. Arevalo R. D. et al.
Mars Organic Molecule Analyzer: Performance of Laser Desorption Ionization Linear Ion Trap Mass Spectrometer **[#1120]**
Performance characteristics of the laser desorption ionization mode of the Engineering Test Unit of Mars Organic Molecule Analyzer Linear Ion Trap Mass Spectrometer is demonstrated.

Rodriguez-Manfredi J. A. de la Torre M. Bridges N. T. Conrad P. G. Ferri F. et al.
MEDA, An Environmental And Meteorological Package For The MARS 2020 Mission. **[#1125]**
This abstract describes MEDA, the environmental instrument recently selected as part of the Mars2020's scientific payload, its goals and concept.

Blagojevic B. Trainer M. G. Pavlov A. A. Prasad C. R.
Bio-Indicator Lidar Instrument for NASA Planetary Missions **[#1140]**
We propose a novel planetary Astrobiology instrument based on a real-time technique of remote detection and discrimination of any bio-signatures dispersed in the ground-level planetary atmosphere.

CUBESATS CONCEPTS FOR PLANETARY MISSIONS

Clark P. E. Dichmann D. Folta D. Lo M. Staehle R. et al.
MOLO: MiniMoon Orbiting Lagrange Observatory **[#1025]**
The MiniMoon Orbiting Lagrange Observatory (MOLO) is an operationally complex, multi-platform Cubesat concept involving 'targets-of-opportunity' encounters with incoming minimoons via Lagrange Points.

Sittler E. C. Jr. Paschalidis N. Cooper J. F. Zesta E. Ali A. et al.
Development of Ion and Neutral Mass Spectrometers (INMS) for Heliophysics and Planetary Missions **[#1041]**
High Precision Electric Gate (HPEG) that can provide precision electric gate ~ 1 ns time resolution, and also acts as a velocity filter. It can provide miniature and lower power ion neutral mass spectrometers for CubeSat applications.

Leiter R. Himwich Z. Natarajan A. Rosenthall J.
SPACE for Cubesats: Small Payloads and Advanced Concepts for Exploration Early Mission Design Tool **[#1027]**
The SPACE tool separates the design process of a CubeSat mission into selection of an instrument or payload and selection of various subsystems.

Kobayashi M. Ishimaru R.
Dust Monitoring Instrument on CubeSat for Small Body Mission **[#1071]**
we describe a concept idea of dust monitoring by CubeSat probe dispatched from the main spacecraft in small body mission.

Collier M. R. Sibeck D. G. Porter F. S.
Soft X-ray Instrumentation for Planetary Exploration: Current Status and Future Potential **[#1079]**
Solar wind charge exchange (SWCX) operates at all solar system objects with atmospheres/exospheres. SWCX generates X-rays that can be used to image characteristic density structures, so spacecraft can map out the boundaries surrounding these bodies.